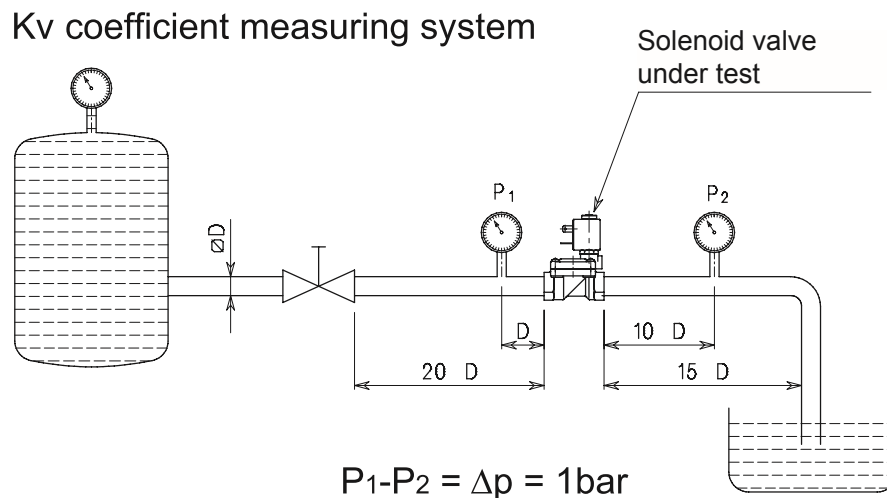


1.8 Flow calculation

Each solenoid valve has a flow coefficient (Kv).

It's possible, with this data, to calculate the flow. Given the loss of flowing pressure (pressure drop), the media type and the working pressure it's possible to calculate the flow rate.

This flow coefficient is determined by way of experimentation according to the standard VDE 2173 and it represents the quantity of water discharged from the solenoid valve with a pressure difference of 1 bar at a temperature between 5°C and 40°C.



Kv	=	m ³ /h	Flow coefficient
Q	=	m ³ /h	Flow
Q _n	=	m ³ n/h	Normal flow (20°C 760mm Hg)
P ₁	=	bar	Inlet pressure (Gauge pressure + 1)
P ₂	=	bar	Outlet pressure (Gauge pressure + 1)
Δp	=	bar	Pressure drop (differential pressure between inlet & outlet)
ρ	=	Kg/dm ³	Relative density referred to water (Water at 4°C = 1)

ρ_n	=	Kg/dm ³	Normal relative density referred to air
G	=	Kg/h	Mass
t	=	°C	Inlet media temperature
V_1	=	m ³ /Kg	Inlet specific volume
V_2	=	m ³ /Kg	Outlet specific volume referred to "P ₂ " pressure and "t" temperature

Liquids : $Q = Kv \sqrt{\frac{\Delta p}{\rho}}$

Gas : $\Delta p = \Delta p < \frac{P_1}{2} \quad Q_n = 514 \times Kv \sqrt{\frac{\Delta p \times P_2}{\rho_n \times (273 + t)}}$

$\Delta p = \Delta p > \frac{P_1}{2} \quad Q_n = 257 \times Kv \frac{P_1}{\sqrt{\rho_n (273 + t)}}$

Air : $\Delta p = \Delta p < \frac{P_1}{2} \quad Q_n = 26 \times Kv \sqrt{\Delta p \times P_2}$

$\Delta p = \Delta p > \frac{P_1}{2} \quad Q_n = Kv \times P_1 \times 13$

Steam : $\Delta p = \Delta p < \frac{P_1}{2} \quad G = 31.6 \times Kv \sqrt{\frac{\Delta p}{V_2}}$

$\Delta p = \Delta p > \frac{P_1}{2} \quad G = 31.6 \times Kv \sqrt{\frac{P_1}{v_1}}$